Richard D. Andrews

Ex. 6 Personal Privacy (PP)

8 December 2011

To: Boulder County Board of Commissioners, written testimony for 8 Dec 2011 Hearing

Re: Sustainable Agriculture Cropland Policy --- Pollinator Health and Protection from pesticides

Dear Will Toor, Cindy Domenico, Ben Pearlman:

Pollinators are essential to the production of food to sustain our lives and the health of our natural world. Around the world, 87 out of 115 of the world's major crops depend upon animal pollination, and approximately 35% of all total global food crop production volume is dependent upon the vital ecosystem services provided by beneficial pollinating insects (1)(2). In short, we cannot survive without our pollinators. We are dependent upon their continued well being, as with so many other ecological services.

However, important pollinators, including honey bees and several other pollinator species are threatened by the use of a particularly dangerous class of chemical insecticides called neonicotinoids. These synthetic chemicals are persistent and systemic, meaning they have very long half lives and translocate throughout the plants to which they are applied, including flower parts, pollen, nectar, and even exuded guttation water, exposing pollinators. These products are neurotoxins and weaken pollinator health, disrupt their learning capabilities to navigate, memories to return to their hives, or otherwise to function normally, and make them susceptible to viral and bacterial infections/diseases and to be more susceptible to predators. These pesticides have been directly linked to what has been termed colony collapse disorder (CCD).

Colony collapse disorder is seriously affecting honeybees and other native pollinators around the world and specifically here in Boulder County. Across the US about 30 to 50% of all hives are lost annually, dramatically higher rates than normal. All of the hives on our farm collapsed last year, failing to survive the winter, and even with entirely new colonies none of the hives produced any harvestable honey this year (2011). None of our hives are going into this winter with sufficient energy reserves or populations and they are unlikely to survive the winter. Many other Boulder County beekeepers are experiencing 50 to 60% or greater collapse annually. This is affecting our local agricultural economy at multiple levels.

Our federal regulatory agencies have failed us with respect to this situation. The U.S. EPA has provided approvals of these insecticides, while at the same time clearly stating that the applications submitted by the chemical companies were deficient in information (called "outstanding data requirements") about

the toxicity evaluations for pollinators and non-target species, specifically regarding nectar and pollen contamination, aquatic life and algal toxicity, groundwater fate, seed leaching, and other matters. They further state in the 2010 Environmental Fate and Effects Division (EFED) report on clothianidin (a specific neonicotinoid) that it is clearly exhibits acute toxicity to bees, stating, "acute toxicity studies to honey bees show that clothianidin is highly toxic on both a contact and an oral basis". The same report also notes a "potential for a long term toxic risk to honey bees and other beneficial insects." Finally, the EPA states that the submitted applicant studies "do not satisfy the [EPA] guideline 850.3040, and another field study is needed to evaluated the effects of clothianidin on bees through contaminated pollen and nectar."(1) In a recently published Society of Environmental Toxicology and Chemistry (SETAC) document jointly authored by US EPA and Bayer, it is acknowledged that even their prescribed toxicology methods are faulted and inappropriate for social insects and for chronic and sub-chronic exposures , or effects on larvae. That document clearly acknowledges, "many who are familiar with pesticide risk assessment recognize that the methodology and testing scheme employed for foliar application products...is not adapted to assess potential hazard and risk from systemic pesticides."(2) But the EPA administration without imposing any remedies other than recommending a "bee precautionary labeling", nevertheless ignored its own scientific guidelines, its own risk assessments and approved these chemicals for wide spread use. The federal environmental and public health protection processes are clearly not functioning could even be said to be incompetent, dysfunctional, or severely corrupted.

In Italy and several other EU countries, neonicotinoids have been banned to protect pollinators. Specifically in Italy, the Pesticides Advisory Committee of the Ministry of Health imposed a three year ban for 2009-2011. During that period studies conducted by a large team of Italian scientists have been conducted which document the restoration of the health of bees (3). The findings confirm a resounding success in restoring the health of bee colonies immediately after the ban on neonicotinoids went into effect. The following table directly from the APENET Italian report presents data on number of colony deaths by year, clearly illustrating the direct association with instituting of the ban and with regions of neonicotinoid use.

**Table 1** – Number of reports submitted to the veterinary services in the spring of 2008, 2009 and 2010 in maize-growing and non maize-growing areas (Source IZSVe, in the Veneto regions).

| Region | N. of reports in maize-growing areas | | | Reports in non maize-growing areas | |
|---|---|---|---|---|---|
| | Spring 2008 | Spring 2009 | Spring **2010** | Spring 2009 | Spring **2010** |
| Lombardy | 40 | 1 | - | | nd |
| Piedmont | 8 | | - | 2 | nd |
| Emilia-Romagna | 7 | 1 + 1* | - | | 2** + 3* |
| Veneto and Trentino | 20 | | - | 3 | 5*** |
| Bolzano | | | - | | 1 |
| Friuli Venezia Giulia | 110 | | - | 1 | 1 |
| Calabria | 0 | | - | 1 | 1 + 2* |
| Basilicata | | | - | | 1 |
| Sardinia | | | | | 1 |
| **TOTAL** | **185** | **2 + 1*** | **0** | **7** | **16 + 5*** |

* Unofficial reports.
** One of the 2 reports concerned a station of the Apenet network
*** In two cases, we detected presence as follows: 1. Bees: Thiamethoxam, Penconazole; 2. Bees: Acetamiprid; Leaves: Acetamiprid, Iprodione, Tebuconazole; the analyses of the other samples are in progress.
nd = following direct contacts (2/7/10) with IZSPLV (Asti) and IZSLER (Brescia) no official communication of the cdf were submitted.

In spring of 2008 prior to the ban, there were 185 reported colony deaths in maize growing areas that used neonicotinoid seed coatings; and after the ban three in Spring 2009 and none in Spring 2010.

Attached are key excerpts from the full APENET 100 page report. This complete document can be made available to you if you desire. Also attached are several other news articles which report on this, plus a joint letter from three Italian beekeeping associations urging a permanent ban. Neighboring Slovenia has just declared a permanent ban. France, and even Germany have also taken action, despite the fact that a major producer of neonicotinoids is the German corporation Bayer. Boulder can be a leader and join this ban on these dangerous pollinator destroying chemicals.

It is notable that one of the most implicated crops involving bee death/CCD has been maize (corn), a crop that is heavily visited by bees and pollinators. I can personally attest to the heavy visitation of corn when flowering by bees. One can actually hear the corn fields buzzing ....that is if one has healthy bee colonies. This last year our sweet corn field was very quiet despite the close proximity to our hives, and that was distressing. (Of course this also refutes the county's theory of short distance pollen dispersal from GMO corn..but that is a separate issue.) This should not be interpreted as safety for use on other crops. For example, neonicotinoid treated sunflower seed is also very dangerous to pollinators. Very recently acquired scientific research findings have also examined the toxicity to bees and other beneficial insects from imbibing guttation water that forms on the leaf surfaces (dew drops) of neonicotinoid treated plants, even plants that have only received seed treatment. The guttation water neonicotinoid concentrations are severely and acutely toxic, causing death to bees within minutes. This is due to the systemic nature of these pesticides which translocates the toxins throughout the plant tissue, even into such exudates as guttation water. This phenomenon would occur irrespective of the plant specie being treated by these pesticides, therefor justifying a ban on all uses, not just corn seed.

I have earlier this year provided a preliminary scientific literature review on the subject of neonicotinoids for the Cropland Policy Advisory Group (CPAG). Unfortunately, the topic was not thoroughly reviewed by or discussed in any depth by CPAG in its deliberations. Since that review I have obtained a great deal more scientific peer reviewed literature that further implicates the toxicity of neonicotinoids. I also travelled to Washington DC this fall to meet personally with both the scientists and regulators of neonicotinoids at the EPA Office of Pesticide Programs (4) and the USDA-Agricultural Research Service Bee Research Lab (5). The visit with EPA confirmed the failures of that agency to even examine the open scientific literature....their fate and effect reports solely rely on and reference pesticide company data. And virtually all of the pesticide application technical information is held as proprietary and is not open to public view. Transparency of the technical review process was absent, and independent assessment virtually impossible. The visit with USDA/ARS Bee Research and specifically with internationally respected apiary scientist Jeffery Pettis provided me with much data, scientific papers, and other information revealing the linkages between CCD, other synergistic honeybee stressors and neonicotinoids.

My research and visits with regulators and scientists have confirmed the basis of my earlier CPAG recommendation that Boulder County must act to ban all neonicotinoids on all of its public lands.

It is our local governmental responsibility to correct this situation by taking independent local action to prohibit these dangerous pesticides that threaten our local agricultural community and our

environment. It is our best hope that sound scientifically grounded thinking can prevail at the local level when it is so utterly absent at the federal level.

I would also ask the county to become advocates to implement a ban throughout the state, to apply not only on county lands. Furthermore, we must be vigilant to ensure that other dangerous pesticides and chemicals are not similarly unleashed upon our food supplies and our environment. The county government should always maintain a willingness to investigate any such concerns.

Sincerely,

Richard Andrews

Former CPAG member

cc: Ron Stewart, David Bell, Jesse Rounds (Boulder County Parks and Open Space)

Specific references and footnotes for above letter:


(1) Aizen, M.A. et al, 2009, How much does agriculture depend on pollinators? Lessons from long-term trends in crop production, Annals of Botany, 103: 1579-1588.

(2) Klein, A-M, et al, 2007, Importance of pollinators in changing landscapes for world crops, Proc. of the Royal Society B, 274: 303-313.

(3) Clothianidin Registration of Prosper T400 Seed Treatment on mustard seed (oilseed and condiment) and Poncho/Votivo Seed Treatment on Cotton, U.S. EPA, Office of Chemical Safety and Pollution Prevention, Memorandum from Joseph DeCant and Michael Barrett, dated Nov 2, 2010, 99 pages.

(4) David Fischer (Bayer Crop Science LP) and Thomas Moriarity (US EPA, Off. Pesticide Programs) (Eds.), Pesticide Risk Assessment for Pollinators: Summary of a SETAC Pellston Workshop, Pensacola, FL, 15-21 Jan 2011 (report released September 2011), SETAC Press, 45 pages.

(5) Marco Lodesani (Project Coordinator) and 18 other scientists, "Effects of coated maize seed on honey bees: Report based on results obtained from the second year (2010) activity of the APENET project", (has also been updated to included results from winter 2010/2011), Consiglio per La Ricerca e la Sperimentazione in Agricoltura (CRA), Unita di Ricerca di apicoltura e Bachicoltura, 2011, 100 pages.

(6) Personal meeting on November 4, 2011 with Richard Andrews and the following personnel of US EPA Office of Pesticide Programs, Washington, DC: Thomas Moriarity, Neonicotinoid Team Leader, Thomas Steeger, Senior Scientist Environmental Fate and Effects Division, and other staff.

(7) Personal meeting on November 4, 2011 Richard Andrews with Jeffery Pettis, PhD., director of USDA-Agricultural Research Service Bee Research Lab, Beltsville, MD.

List of attachments and excerpts:

1. Excerpts from: Marco Lodesani (Project Coordinator) and 18 other scientists, "Effects of coated maize seed on honey bees: Report based on results obtained from the second year (2010) activity of the APENET project", (has also been updated to included results from winter 2010/2011), Consiglio per La Ricerca e la Sperimentazione in Agricoltura (CRA), Unita di Ricerca di apicoltura e Bachicoltura, 2011.
   a. From pages 5 (field monitoring network), the data clearly show the dramatic decline in colony deaths after the neonicotinoid ban (after the 2008 planting season) for subsequent years 2009 and 2010; *and "the surveys conducted so far has shown that in the absence of pesticide residues, the presence of nosema and bee viruses did not cause bee populatin decline or die-off of bees and hives. By contrast, reports of acute bee die-offs were associated with marked presence of pesticide residues."*
   b. From pages 37-38 (conclusions on effects on bees over corn sowing), "*The results of these trials indicate that when a bee travelling towards a food source flies over a seeder that is sowing insecticide-coated maize seed, the bee may be exposed to a lethal dose of active ingredient, probably even in a single flight. The results also demonstrate that the dust emitted by the seeder is sufficient to kill the bees without the poisoning effect being mediated by ingestion of contaminated food."*
   c. From pages 58-59 (guttation water effects), Concentrations of three neonicotinoid chemicals were assayed in guttation water from seed treated plants. Active ingredient concentrations for clothianidin ranged from 82.9 to 267 mg/liter, 145 to 207 mg/l for thiamethoxam, and from nd to 225 mg/l for imidacloprid. (from other research, these levels are above acute toxicity values). From pages 63-64, guttation water neonic concentrations trended significantly higher (up to 5x to 6x) beginning the first two weeks after plant emergence under various moisture regimes, before subsequently declining.
   *d.* From pages 78 thru 96 (lethal and sublethal effects on bees): *"the results highlight a significant effect of clothiandin (Poncho)-treated maize seed dust on bee mortality. The peak of mortality was observed immediately after bee exposure to the active ingredient."* Regarding foraging and behavior: *"Observations...revealed normal behavior for untreated bees. In contrast, only one of the bees treated with the highest clothianidin dose returned to the nest, where it did not discharge pollen, and remained isolated and immobile for a prolonged period of time. Bees treated with the lower clothianidin dose did return to the nest but they experienced difficulty in discharging pollen, and during the first 3 hours of observation they did not return to the dispenser. Of the clothianidin-treated bees, only 80% reappeared the next day."* Regarding homing ability (data analysis still in progress): *"lost bees amounted to 10% in the clothianidin-treated group, and 3.4% in the control group."* Regarding memory/odor-color recognition response: *"...at 24 hours after administration of [neonic] treatment, sub-lethal dose of all active ingredients contained in dust ....were capable of compromising bee ability to visit a known food source and to recognize the colours associated with the sucrose reward. For imidacloprid and clothianidin this effect was visible as early as 60 minutes after administration of the treatment."*

2. Letter from three Italian beekeeper associations to Italian pesticide and public health ministries requesting permanent ban on neonicotinoids, 27 June 2011 (in Italian); accompanying email from local Boulder County beekeeper providing an English translation of a key paragraph.

3. Articles from www.youris.com
   Italy keeps ban on neonicotinoid seed coating to save bees 26 May 2009
   Massive bee loss coincided overwhelmingly with maize sowing 29 May 2009
   Bees restored to health in Italy after this spring's neonicotinoid-free maize sowing 26 June 2009
4. Articles from www.mieliditalia.it reporting on neonicotinoid ban extension in Italy and related matters (translated to English).

5. Letter from six beekeeping and environmental associations to U.S. EPA administrator Lisa Jackson calling for a moratorium on the use of clothianidin, a specific neonicotinoid.

6. Earlier literature review and cropland policy recommendation provide by Richard Andrews to CPAG. Updated addendum to scientific literature bibliographic references, dated 15 November 2011, prepared by Richard Andrews and additional recent updates for scientific literature on pollinator health and neonicotinoid pesticides (abstracts and references).